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08/925,321 09/08/97 VUORINEN T 30-336

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EXAMINER

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**BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES**

Paper No. 28

Application Number: 08/925,321
Filing Date: 9/8/97
Appellant(s): VUORINEN et al

Robert A. Vanderhye
For Appellant

MAILED

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GROUP 1700

EXAMINER'S ANSWER

This is in response to appellant's brief on appeal filed 5-20-1999.

(1) *Real Party in Interest*

A statement identifying the real party in interest is contained in the brief.

(2) *Related Appeals and Interferences*

A statement identifying the related appeals and interferences which will directly affect or be directly affected by or have a bearing on the decision in the pending appeal is contained in the brief.

(3) *Status of claims.*

The statement of the status of claims contained in the brief is correct.

(4) *Status of Amendments After Final.*

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

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(5) *Summary of invention.*

The summary of invention contained in the brief is correct.

(6) *Issues.*

The appellant's statement of the issues in the brief is correct.

(7) *Grouping of claims.*

Appellant states that all of the claims are independently patently distinct from each other.

(8) *Claims appealed.*

The copy of the appealed claims contained in the Appendix to the brief is correct.

(9) *Prior Art of record.*

The following is a listing of the prior art of record relied upon in the rejection of claims under appeal.

REFERENCES

✓ 511 695 EP November 4, 1992

✓ LACHENAL et al, "Optimization of Bleaching Sequences Using Peroxide as First Stage", 1982 International Pulp Bleaching Conference.

✓ MARECHAL, "Acid Extraction of the Alkaline Wood Pulps (Kraft or Soda/AQ) Before or During Bleaching", Journal of Wood Chemistry and Technology, 13(2), p 261-281 (1993).

✓ ADMITTED PRIOR ART, page 4, lines 13-22 of the instant specification.

(10) *New prior art.*

No new prior art has been applied in this examiner's answer.

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(11) *Grounds of rejection.*

The following ground of rejection are applicable to the appealed claims.

Claims 1, 3-8 and 10-31 are rejected under 35 U.S.C. 103(a) as being unpatentable over EP 511 695 in view of ADMITTED PRIOR ART (page 4, lines 13-22 of the instant specification) with or without LACHENAL ET AL with or without MARECHAL.

EP 511 695 teaches treating chemical cellulose pulp (see Example 1) produced by alkaline delignification (sulphate pulp) having a kappa number under 24 (kappa number 17) with an acid at a pH of 2.3 (Table I) at temperatures up to 95°C for times up to 120 minutes (see page 3, lines 55-59). This is the same hexenuronic acid removal step taught by Appellant. It would have been obvious to one of ordinary skill in the art that the sulphate pulp of EP 511 695 would contain hexenuronic acid as such is taught by the ADMITTED PRIOR ART. The sulphate (kraft) pulp of EP 511 695 would contain hexenuronic acid as it is contained in all sulphate pulps. The mere discovery of an additional, possibly heretofore unrecognized feature of a process, otherwise obvious over the prior art, does not alone render that process unobvious. In the instant case EP 511 695 teaches treating kraft pulp with the same acid treatment used by Appellant prior to a bleaching step. The discovery that the acid step removes hexenuronic acid, does not render the process unobvious as the acid step of EP 511 695 would react on the kraft pulp (which contains hexenuronic acid) in the same manner taught by Appellant, e.g. remove hexenuronic acid. See In re Best 195 USPQ 430. The claimed process steps do not differ from the process steps of EP 511 695, e.g. treating kraft pulp with an acid followed by bleaching. It would have been obvious to

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use the higher temperatures disclosed by EP 511 695, e.g. up to 95°C as chemical reactions are known to be temperature rate effective. If this is not obvious then LACHENAL ET AL teaches that raising the temperature in the acid pretreatment results in a further decrease in kappa No. after the bleaching stage and further improves the bleachability of the pulp as kraft lignin becomes more susceptible to solubilization (See LACHENAL ET AL, page 147, second half of column 1, including Table 4). It would have been obvious to one of ordinary skill in the art to further reduce the kappa No. and increase the bleaching of EP 511 695 by increasing the temperature of the acid treatment as taught by LACHENAL ET AL. Claim 3 is rejected as the equation includes values within the time range of EP 511 695, e.g. temperature of 95°C and time of 120 minutes (see page 3, lines 55-59). See EP 511 695, page 3, lines 48-54 for treating hardwood kraft pulp with a kappa No. As low as 5. See page 3, lines 6-10 for P, Z, O, P_A, P-Z and (PO)-Z bleach sequences. Claims 20 and 21 are rejected as EP 511 695 teaches using further bleach stages to obtain brightness levels above 80 ISO (see Example 3). MARECHAL teaches that acid hydrolysis at high temperatures, e.g. 95-100°C (page 264, line 3), improves (e.g. lower kappa number) the bleaching of pulp that follows the high temperature acid treatment (e.g. peroxide, oxygen or chlorine). It would have been obvious to use the 95°C temperature of the EP 511 695 to obtain the improvements in subsequent bleaching as taught by MARECHAL. MARECHAL also teaches that the acid hydrolysis removes organic acids (pages 272-278).

(12) *New ground of rejection.*

This Examiner's Answer does not contain any new ground of rejection.

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(13) *Response to argument.*

The argument that Appellant discovered that kraft pulps contain hexenuronic acid groups is not convincing. The discovery that kraft pulp contains hexenuronic acid or that the acid step removes hexenuronic acid, does not render the process unobvious as the acid step of EP 511 695 would react on the kraft pulp (which contains hexenuronic acid) in the same manner taught by Appellant, e.g. remove hexenuronic acid. See *In re Best* 195 USPQ 430. Whether it was known that kraft pulp contains hexenuronic acid or not is immaterial as Appellant acknowledges that sulphate pulps (kraft) do contain hexenuronic acid groups. Thus the kraft pulp of EP 511 695 does contain hexenuronic acids.

Appellant argues that there is nothing in the art that teaches increasing the temperature of LACHENAL et al or EP 511 695. However, MARECHAL teaches improvement of processes that remove metal ions from the pulp by hot acid treatment, e.g. over the processes of EP 511 695 and LACHENAL et al, by using temperatures of 100°C (paragraph bridging pages 264 and 266 and first two paragraphs of page 266, especially page 266, line 12). MARECHAL teaches that at 100°C the lignin can be dissolved during the acid treatment stage alone and that the kappa number can further be decreased (page 264, last full sentence). MARECHAL further teaches, page 279, last two full paragraphs that at 90-110°C that total extraction can be achieved and at 103°C that full extraction can be obtained with minimal decrease in viscosity ($\Delta\eta=65$ ml/g). It would have been obvious to the artisan to use the temperatures of MARECHAL in the acid stage of EP 511 695 to obtain complete lignin dissolution and to further lower the kappa number. It is also noted

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that MARECHAL removes carboxylic acid groups (e.g. 2-furancarboxylic acid) which would include the hexenuronic acids which are carboxyl acid type groups, see instant specification, page 7, lines 25-27.

The advantage obtained by Appellant is a reduction in bleach chemical consumption. LACHENAL and MARECHAL teach that increases the pretreatment temperature results in an increased bleaching, as represented by the decreased Kappa No. in Table 4 of LACHENAL after the peroxide bleaching and TABLE 3 of MARECHAL. It would have obvious to the artisan that increasing the bleaching would enable the artisan to use a lesser amount of bleaching agent. Thus any advantage obtained by Appellant would have been obvious from the combination of the references. MARECHAL (paragraph bridging pages 263-264) appears to be treating the same pulp (alkaline, e.g. kraft, page 264, middle of page) under the same conditions of temperature (95-100 degrees C) for the same amount of time (40 minutes) and at the same pH (2.18), see MARECHAL, at a consistency of between the claimed 1-50% to lower the kappa number at least 2 kappa units. Any hexenuronic acid removed by Appellant would have also been removed by MARECHAL.

The first Declaration of Mr. Vuorinen in the Parent Application has been considered but does not overcome the rejection as the comparison was made to LACHENAL ET AL and not to the primary reference (EP 511 695). EP 511 695 which teaches a preferred pH of 2-4. This corresponds to the disclosed pH of 2-5 and the disclosed preferred pH of 2.5 to 4 (specification, page 8, lines 19-22). Although EP 511 695 teaches a preferred temperature of 40-80°C,

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temperatures up to 95°C are taught (page 3, lines 55-56). The temperature range of EP 511 695 overlaps the claimed range. See Ex parte Lee 31 USPQ 2d 1105, 1106. Besides LACHENAL ET AL discloses using a hot acid stage (up to 90°C) at a pH 2.0 for a time of 2 hours. This does not significantly differ from the conditions taught by Appellant. Paragraph 12 of the Declaration states that LACHENAL optimally treats the pulp at a pH of 2 for a temperature of 60-80°C. From Table 4 of LACHENAL ET AL it would have been obvious to use a temperature of 90°C to obtain an improved Kappa No. (17.5) and increased bleaching. Exhibit D of the Declaration shows that at pH of 2.0 only 6.5 meq/kg of hexenuronic acid is removed is not convincing as this is at 70°C and not at the 95°C of EP 511 695 or the 90°C of LACHENAL ET AL. Besides it would have been obvious to use the 95°C of EP 511 695 for the advantages taught by MARECHAL.

The Second Declaration of Mr Vuorinen is not convincing as MARECHAL concludes that under certain conditions the viscosity decrease is acceptable, e.g. page 262, second paragraph and last paragraph on page 279. In addition MARECHAL shows in Table 3 that the viscosity decrease in the acid treatment stage is less than the normal oxygen delignification (850 vs. 767). Clearly a viscosity of 850 is acceptable for pulp while the Kappa number was lowered from 20.1 to 11.7 (42%) and to a kappa number of 2.6 after oxygen bleaching as MARECHAL teaches that a viscosity greater than 760 is an acceptable (without excessive degradation of polysaccharides) viscosity (page 262, paragraph 2, line 4). It is noted that MARECHAL also teaches that the acid treated pulp can be bleached with peroxide, page 266, line 3. In the Declaration, paragraph 4 it is

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argued that the yield of MARECHAL is low. However, on page 271, MARECHAL teaches that the yield after hydrolysis was 96.3% after an acid treatment at 103 degrees C. There is no evidence that the instant process obtains a better yield than the process of MARECHAL.

Appellants do not present any specific arguments as to how the limitations set forth in the dependent claims are separately patentable over the cited prior art. Appellant merely recites the language of each dependent claim and states the art does not teach or suggest the combination for each dependent claim. In the absence of substantive arguments explaining why the specific limitations in the rejected claims render the claims separately patentable over the applied art, the rejections of these dependent claims should be affirmed. See 37 CFR § 1.192 (c)(6)(iv)(1993).

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,



STEVE ALVO
PRIMARY EXAMINER
ART UNIT 1731

MSA

September 29, 2000

Conferees: Jan Sillbaugh

Patrick Ryan 

